CLAIMS

What is claimed is:

1. A method of providing a single console control point for a network device cluster, wherein the cluster comprises a first switch device, a plurality of active routers, one or more standby routers, and a second switch device, the method comprising the computer-implemented steps of:

receiving user input specifying an operation to perform on the cluster as a whole; and

automatically performing the specified operation on one or more of the active routers in the cluster by transforming the specified operation into one or more device-specific operations for each of the one or more active routers.

2. A method as recited in Claim 1, wherein the receiving step comprises receiving user input specifying a configuration command for the cluster; and wherein the performing step comprises automatically communicating the configuration command to each of the active routers in the plurality of active routers.

3. A method as recited in Claim 2, further comprising the steps of:

subscribing a management process to an event bus;

subscribing each of the active routers to the event bus; and

publishing the configuration command in an event on the event bus.

4. A method as recited in Claim 3, further comprising the steps performed at each of the active routers of:

receiving the event;

extracting the configuration command from the event; and

presenting the configuration command to a native console.

5. A method as recited in Claim 2, wherein the configuration command is a configuration load command.

6. A method as recited in Claim 2, wherein the configuration command is a configuration execution command.

7. A method as recited in Claim 2, wherein the user input is received in a graphical user interface, and further comprising the step of displaying an execution log for the configuration command within the same graphical user interface in which the user input is received.

8. A method of providing a single console control point for a network device cluster, wherein the cluster comprises a first switch device, a stack consisting of one or more active routers and one or more standby routers, and a second switch device, the method comprising the computer-implemented steps of:

receiving first user input requesting an operational overview of the cluster; and

generating and displaying an operational overview of the cluster, wherein the operational overview comprises a status indicator, connection information, failed device information, and a first access icon for accessing information about the stack.

9. A method as recited in Claim 8, further comprising the steps of:

receiving second user input that selects the first access icon;

generating and displaying a device operational overview for devices in the cluster, wherein the device operational overview comprises, for each router in the stack of the cluster, a device status indicator, device connection information, failed connection information, and a second access icon for accessing information about connections of the switch devices and the stack.

10. A method as recited in Claim 8, further comprising the steps of:

receiving third user input that selects the second access icon;

generating and displaying a connection operational overview for connections of the cluster, wherein the connection operational overview comprises, for each connection of the stack, a connection status indicator and one or more values of attributes associated with the connection.

11. A method of providing a single console control point for a network device cluster, the method comprising the computer-implemented steps of:

receiving first user input in a user interface (UI) that identifies a first switch device and a second switch device for a network device cluster;

receiving second user input in the UI that identifies a plurality of network elements for a router stack of the cluster;

receiving third user input in the UI that defines at least one first connection of the first switch device in association with at least one network element in the stack, and at least one second connection of the second switch device in association with at least one network element in the stack; and

associating the first, second, and third user input in a cluster object that programmatically represents the cluster.

12. A method as recited in Claim 11, further comprising the steps of:

receiving information specifying that a network element in the cluster has failed;

based on the cluster object, selecting a substitute network element from among one or more available network elements from the router stack;

receiving connection configuration information from the identified network element; and

based on the connection configuration information, re-configuring the substitute network element and the one or more switch devices associated with the identified network element, wherein the re-configuring causes the one or more switch devices to change one or more connections from the identified network element to the substitute network element.

13. A method as recited in Claim 12, wherein the step of re-configuring the substitute network element and the one or more switch devices associated with the identified network element further comprises the steps of:

creating one or more sets of commands to configure the one or more switch devices; and

publishing a configuration load event that includes the commands and that targets only the one or more switch devices associated with the identified and substitute network elements.

14. A method as recited in Claim 13, wherein the step of re-configuring the substitute network element and the one or more switch devices associated with the identified network element further comprises the steps of:

in response to the configuration load event, each of the one or more switch devices connecting to the cluster manager and receiving a particular set of commands;

at each of the one or more switch devices, processing the particular set of commands, wherein processing includes causing the one or more switch devices to change the one or more connections from the identified network element to the substitute network element; and

at each of the one or more switch devices, publishing a configuration complete event to acknowledge completing the processing of the particular set of commands.

15. A method as recited in Claim 11, wherein the third user input includes information defining a set of commands used to reconfigure at least one switch device from the plurality of switch devices.

16. A method as recited in Claim 11, wherein the first, second and third user inputs are stored persistently at a cluster manager; and wherein each of the plurality of switch devices and the plurality of network elements persistently stores startup configuration information, but does not store the first, second and third user inputs.

17. A method as recited in Claim 11, wherein the second user input comprises information identifying one or more network elements from the plurality of network elements as back-up network elements.

18. A method as recited in Claim 11, wherein the second user input comprises information identifying one or more network elements from the plurality of network elements as stand-by network elements.

19. A method as recited in Claim 11, further comprising the step of receiving a fourth user input in the UI that modifies information received in the second and third user inputs.

20. A method as recited in Claim 11, further comprising the step of receiving a fourth user input in the UI that identifies at least one network element as removed from the plurality of network elements.

21. A method as recited in Claim 11, further comprising the step of receiving a fourth user input in the UI that disassociates at least one switch device from the plurality of switch devices with at least one network elements from the plurality of network elements.

22. A method as recited in Claim 11, wherein the first, second, and third user inputs define a logical stack object, wherein the logical stack object is identified by a stack name and represents a logical grouping of at least two switch devices and at least one network element.

23. A method as recited in Claim 22, further comprising the step of receiving a fourth user input in the UI that requests sending a command to all switch devices and all network elements represented by the logical stack object.

24. A user interface (UI) located at a user device for use in providing a single console control point for a network device cluster, comprising:

an input mechanism for receiving user input, wherein the user input includes:

a first user input that identifies a plurality of switch devices in a logical stack object that represents the network device cluster;

a second user input that identifies a plurality of network elements in the network device cluster; and

a third user input that associates at least one switch device from the plurality of switch devices with at least one network element from the plurality of network elements; and

an execute mechanism for causing re-provisioning of real network elements that are represented by the logical stack object.

25. A user interface as recited in Claim 24, wherein the execute mechanism comprises instructions which, when executed by a processor, cause the processor to perform the steps of:

identifying a network element that has failed;

selecting a substitute network element from among one or more available network elements from the plurality of network elements;

receiving connection configuration information from the identified network element; and

based on the connection configuration information, re-configuring the substitute network element and the one or more switch devices associated with the identified network element, wherein the re-configuring causes the one or more switch devices to change one or more connections from the identified network element to the substitute network element.

26. An apparatus for providing a single console control point for a network device cluster, wherein the cluster comprises a first switch device, a plurality of active routers, one or more standby routers, and a second switch device, the apparatus comprising:

means for receiving user input specifying an operation to perform on the cluster as a whole; and

means for automatically performing the specified operation on one or more of the active routers in the cluster by transforming the specified operation into one or more device-specific operations for each of the one or more active routers.